

A Data Abstraction Architecture for Spacecraft Autonomy, Phase I

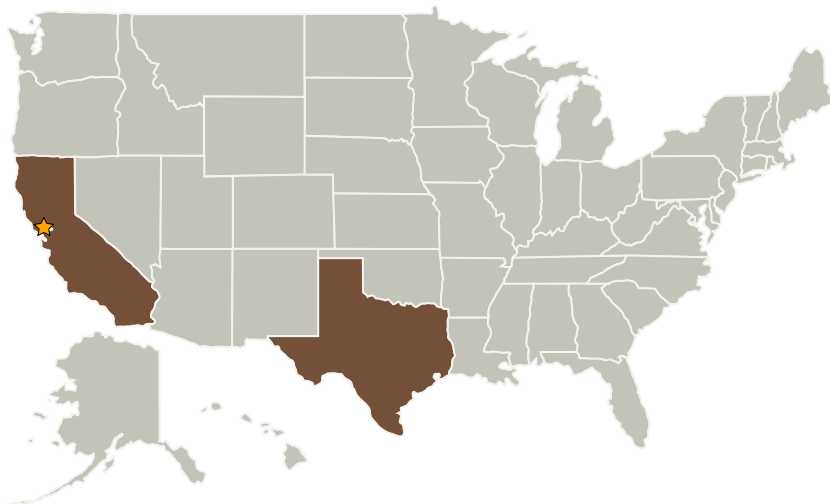
Completed Technology Project (2007 - 2007)



Project Introduction

Spacecraft generate huge amounts of data. A significant challenge for both human operators and autonomous control systems is ensuring that the right data (and combinations of data) are available at the right time for control and decision-making and ensuring that the data is at the right abstraction level. A key part of this process is data abstraction -- that is converting low-level analog or digital signals into higher-level data. We are proposing a data abstraction architecture that provides a tool-box of components, connections and development environment that allow engineers to build and maintain data abstraction systems. In addition, having a well-defined data abstraction architecture allows data displays to be automatically generated and updated as the architecture develops. Thus, a data abstraction architecture can support both human decision-making as well as providing data services to autonomous control systems. We are also proposing to build an integrated development environment in which designers or operators can graphically build data abstraction architectures from standard components to accomplish their data tasks. Together these provide a data abstraction architecture that is a key component of NASA's operational infrastructure and provides a building block for deploying more advanced autonomy architectures in the future.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Ames Research Center (ARC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★ Ames Research Center(ARC)	Lead Organization	NASA Center	Moffett Field, California
TRAC Labs, Inc.	Supporting Organization	Industry	Webster, Texas

Primary U.S. Work Locations

California	Texas
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Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX10 Autonomous Systems
 - └ TX10.4 Engineering and Integrity
 - └ TX10.4.5 Architecture and Design of Autonomous Systems